

**Abstract of the Disclosure**

Systems and methods for noninvasive assessment of cardiac tissue properties and cardiac parameters using ultrasound techniques are disclosed. Determinations of myocardial tissue stiffness, tension, strain, strain rate, and the like, may be used to assess myocardial contractility, myocardial ischemia and infarction, ventricular filling and atrial pressures, and diastolic functions. Non-invasive systems in which acoustic techniques, such as ultrasound, are employed to acquire data relating to intrinsic tissue displacements are disclosed. Non-invasive systems in which ultrasound techniques are used to acoustically stimulate or palpate target cardiac tissue, or induce a response at a cardiac tissue site that relates to cardiac tissue properties and/or cardiac parameters are also disclosed.